

Eutrophication in the Gulf of Maine: Analysis of key ESIP indicators
James S. Latimer and Christine M. Tilburg

The Gulf of Maine and its watershed encompass more than 170,000 km² and is home to more than 6.5 million Canadians and Americans. Despite its long-standing importance to fisheries and natural resources and current interest in exploration of wind and tide as renewable energy sources, the ecosystem as a whole is not well understood. Acknowledging the need to evaluate the Gulf of Maine as a region-wide system, the Gulf of Maine Council on the Marine Environment (GOMC) launched an effort in 2004 to identify and deliver priority indicators of ecosystem health through the Ecosystem Indicator Partnership (ESIP). Subcommittees were established for seven theme areas (coastal development, climate change, contaminants, eutrophication, aquatic habitats, fisheries and aquaculture). Currently more than 140 expert advisors from local, state/provincial and federal governments, along with academics and partners from non-government organizations participate in one or more of these subcommittees. Following a consensus-based process, the subcommittees selected priority indicators for each of the theme areas.

One of the key theme areas for ESIP is eutrophication resulting from point and non-point nutrient pollution. Data on four indicators were obtained to track trends in eutrophication (nitrogen loading, dissolved oxygen (DO), water clarity, and chlorophyll-a) for twenty-two embayments from Massachusetts through Nova Scotia. Results show that these important causal and response variables change spatially and temporally throughout the region. Moreover, associations between nitrogen inputs and DO, water clarity, and chlorophyll-a were observed. These results have implications for water quality management as well as for ecosystem health assessments. All of the data collected from the Gulf of Maine are currently available in ESIP's Indicator Reporting Tool (www2.gulfofmaine.org/esip/reporting).